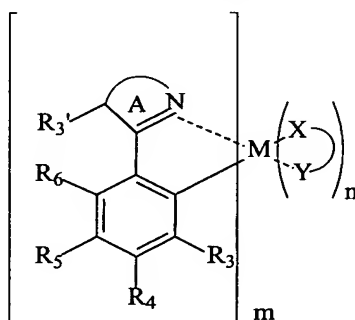


Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended) A compound having the structure:



wherein

M is a metal having an atomic weight greater than 40;

R₃' is a substituent selected from the group consisting of alkyl, heteroalkyl, aryl, heteroaryl, and aralkyl, wherein R₃' is optionally substituted by one or more substituents Z;

R₅ is a substituent selected from the group consisting of aryl and heteroaryl, wherein said aryl or heteroaryl is unsubstituted or optionally, substituted with one or more non-aromatic groups;

ring A is an aromatic heterocyclic or a fused aromatic heterocyclic ring with at least one nitrogen atom that is coordinated to the metal M, wherein the ring A can be optionally substituted with one or more substituents Z;

R₃, R₄, and R₆ is are each independently a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, perfluoroalkyl CF₃, C_nF_{2n+1}, trifluorovinyl, CO₂R, C(O)R, NR₂, NO₂, OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;

R₄ is a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, CF₃, C_nF_{2n+1}, trifluorovinyl, CO₂R, C(O)R, NR₂, NO₂, OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;

additionally or ~~alternatively~~ alternatively, R_3 and R_4 , together form independently a fused 4 to 7-member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl; and wherein said cyclic group is optionally substituted by one or more ~~substitutents~~ substituent Z;

~~R_6 is a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, CF_3 , C_nF_{2n+1} , trifluorovinyl, CO_2R , $C(O)R$, NR_2 , NO_2 , OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;~~

~~alternatively, R_3' and R_6 may be bridged by a group selected from CR_2-CR_2 , $CR=CR$, CR_2 , O, NR, $O-CR_2$, $NR-CR_2$, and $N=CR$;~~

each R is independently H, alkyl, alkenyl, alkynyl, heteroalkyl, aryl, heteroaryl, or aralkyl; wherein R is optionally substituted by one or more substituents Z;

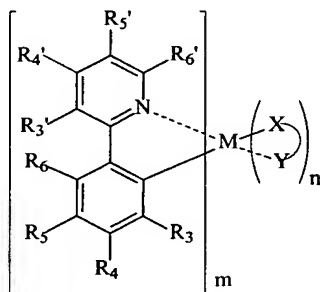
each Z is independently a halogen, R' , $O-R'$, $N(R')_2$, SR' , $C(O)R'$, $C(O)OR'$, $C(O)N(R')_2$, CN, NO_2 , SO_2 , SOR' , SO_2R' , or SO_3R' ;

~~each~~ Each R' is independently H, alkyl, perhaloalkyl, alkenyl, alkynyl, heteroalkyl, aralkyl, aryl, or heteroaryl;

(X-Y) is an ancillary ligand;

m is a value from 1 to the maximum number of ligands that may be attached to the metal; and $m + n$ is the maximum number of ligands that may be attached to the metal.

Claim 2 (currently amended) The compound of claim 1, having the structure:



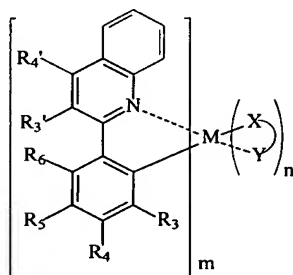
wherein

R_4' , R_5' , and R_6' are each independently H, alkyl, alkenyl, alkynyl, heteroalkyl, ~~alkenyl, alkynyl, heteroalkyl~~, aryl, heteroaryl, aralkyl; and wherein R_4' , R_5' , and R_6' are optionally substituted by one or more substituents Z; and

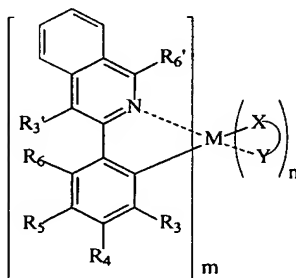
additionally or alternatively, any one or more of R_4' and R_5' , or R_5' and R_6' , or R_3 and R_4 , together form independently a fused 4- to 7-member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl; and wherein said cyclic group is optionally substituted by one or more substituent Z;

~~additionally or alternatively, R_3' and R_6 are linked by a group having the formula: CR_2-CR_2 , $CR=CR$, CR_2 , O, NR, O- CR_2 , NR- CR_2 , N=CR wherein R is selected from the group consisting of H, alkyl, aryl, and aralkyl.~~

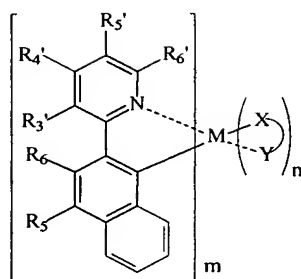
Claim 3 (original) The compound of claim 2, having the structure:



Claim 4 (original) The compound of claim 2, having the structure:



Claim 5 (original) The compound of claim 2, having the structure:

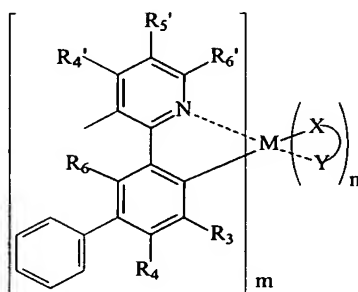


Claim 6 (original) The compound of claim 2, wherein R₅ is substituted or unsubstituted phenyl, naphthyl or pyridyl.

Claim 7 (original) The compound of claim 6, wherein R₅ is a phenyl.

Claim 8 (original) The compound of claim 6, wherein R'₃ is a methyl group.

Claim 9 (original) The compound of claim 2, having the structure:

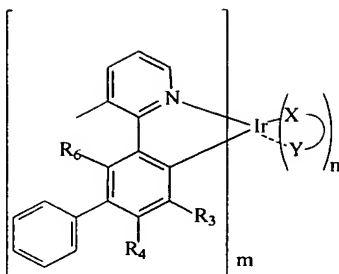


wherein R₅' and R₆' are H, and additionally or alternatively, together form a fused 4- to 7- member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl.

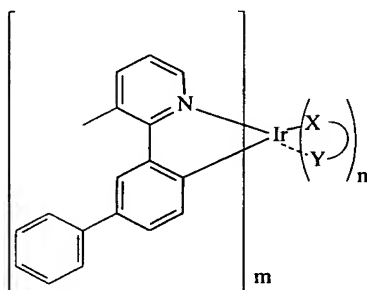
Claim 10 (original) The compound of claim 9, wherein M is selected from the group consisting of Ir, Pt, Pd, Rh, Re, Ru, Os, Tl, Pb, Bi, In, Sn, Sb, Te, Au, and Ag.

Claim 11 (original) The compound of claim 10, wherein M is Ir.

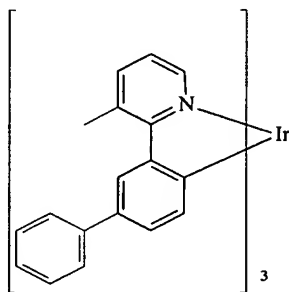
Claim 12 (original) The compound of claim 11, having the structure:



Claim 13 (original) The compound of claim 12, having the structure:

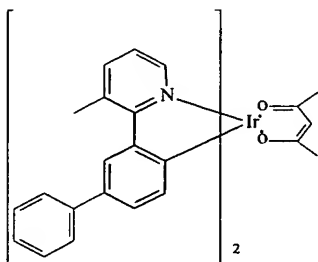


Claim 14 (original) The compound of claim 13, wherein m is 3 and n is zero, such that the compound has the structure:

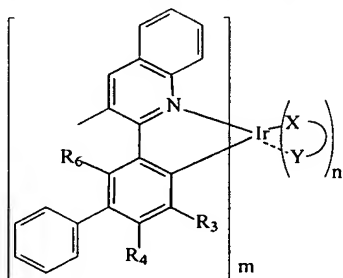


Claim 15 (original) The compound of claim 13, wherein m is 2 and n is 1.

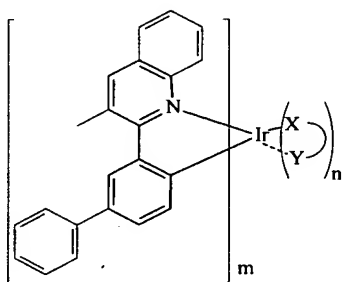
Claim 16 (original) The compound of claim 15, having the structure:



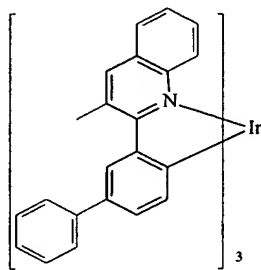
Claim 17 (original) The compound of claim 11, having the structure:



Claim 18 (original) The compound of claim 17, having the structure:

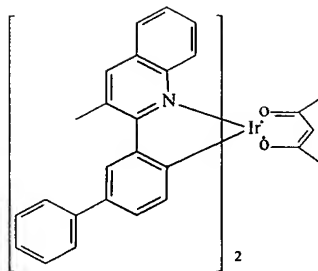


Claim 19 (original) The compound of claim 18, wherein m is 3 and n is zero, such that the compound has the structure:

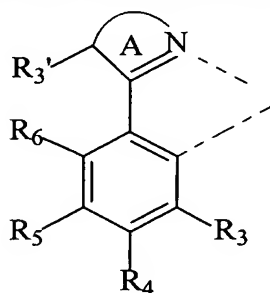


Claim 20 (original) The compound of claim 18, wherein m is 2 and n is 1.

Claim 21 (original) The compound of claim 20, having the structure:



Claim 22 (currently amended) A compound comprising a ligand having the structure:



wherein

~~M is a metal having an atomic weight greater than 40;~~

R₃' is a substituent selected from the group consisting of alkyl, heteroalkyl, aryl, heteroaryl, and aralkyl, wherein R₃' is optionally substituted by one or more substituents Z;

R₅ is a substituent selected from the group consisting of aryl and heteroaryl, wherein said aryl or heteroaryl is unsubstituted or optionally, substituted with one or more non-aromatic groups;

ring A is an aromatic heterocyclic or a fused aromatic heterocyclic ring with at least one nitrogen atom ~~that is coordinated to the metal M~~, wherein the ring A can be optionally substituted with one or more substituents Z;

~~R₃, R₄, and R₆ is~~ are each independently a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, perfluoroalkyl CF₃, C_nF_{2n+1}, trifluorovinyl, CO₂R, C(O)R, NR₂, NO₂, OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;

~~R₄ is a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, CF₃, C_nF_{2n+1}, trifluorovinyl, CO₂R, C(O)R, NR₂, NO₂, OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;~~

additionally or ~~alternatively~~ alternatively, R₃ and R₄, together form independently a fused 4 to 7-member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl; and wherein said cyclic group is optionally substituted by one or more ~~substituents~~ substituent Z;

~~R₆ is a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, CF₃, C_nF_{2n+1}, trifluorovinyl, CO₂R, C(O)R, NR₂, NO₂, OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;~~

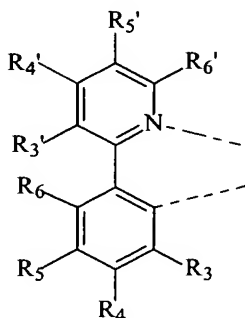
~~alternatively, R₃' and R₆ may be bridged by a group selected from CR₂CR₂, CR=CR, CR₂, O, NR, OCR₂, NR-CR₂, and N=CR;~~

each R is independently H, alkyl, alkenyl, alkynyl, heteroalkyl, aryl, heteroaryl, or aralkyl; wherein R is optionally substituted by one or more substituents Z;

each Z is independently a halogen, R', O-R', N(R')₂, SR', C(O)R', C(O)OR', C(O)N(R')₂, CN, NO₂, SO₂, SOR', SO₂R', or SO₃R';

each R' is independently H, alkyl, perhaloalkyl, alkenyl, alkynyl, heteroalkyl, aralkyl, aryl, or heteroaryl.

Claim 23 (currently amended) The compound of claim 22, wherein the ligand has the structure



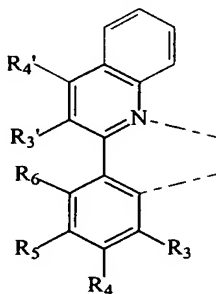
wherein

R₄', R₅', and R₆' are each independently H, alkyl, alkenyl, alkynyl, heteroalkyl, ~~alkenyl, alkynyl, heteroalkyl~~, aryl, heteroaryl, aralkyl; and wherein R₄', R₅', and R₆' are optionally substituted by one or more substituents Z; and

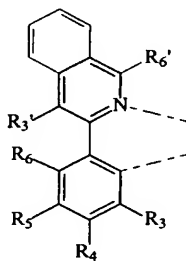
additionally or alternatively, any one or more of R_4' and R_5' , or R_5' and R_6' , or R_3 and R_4 , together form independently a fused 4- to 7-member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl; and wherein said cyclic group is optionally substituted by one or more substituent Z ;

~~additionally or alternatively, R_3' and R_6 are linked by a group having the formula: CR_2-CR_2 , $CR=CR$, CR_2 , O , NR , $O-CR_2$, $NR-CR_2$, $N=CR$ wherein R is selected from the group consisting of H, alkyl, aryl, and aralkyl.~~

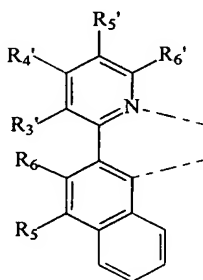
Claim 24 (original) The compound of claim 23, wherein the ligand has the structure:



Claim 25 (original) The compound of claim 23, wherein the ligand has the structure:



Claim 26 (original) The compound of claim 23, wherein the ligand has the structure:

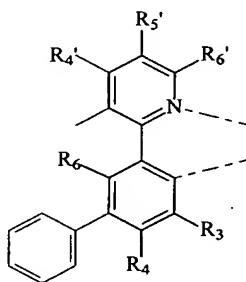


Claim 27 (original) The compound of claim 23, wherein R_5 is substituted or unsubstituted phenyl, naphthyl or pyridyl.

Claim 28 (original) The compound of claim 27, wherein R_5 is a phenyl.

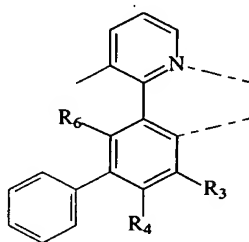
Claim 29 (original) The compound of claim 27, wherein R'_3 is a methyl group.

Claim 30 (original) The compound of claim 23, wherein the ligand has the structure:

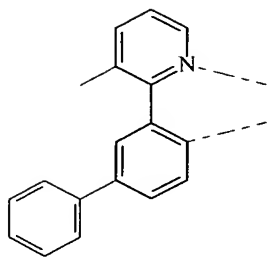


wherein R_5' and R_6' are H, and additionally or alternatively, together form a fused 4- to 7- member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl.

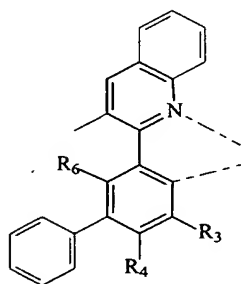
Claim 31 (original) The compound of claim 30, wherein the ligand has the structure:



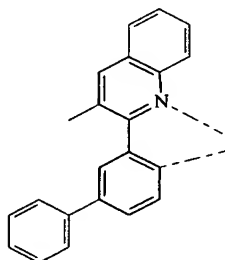
Claim 32 (original) The compound of claim 31, wherein the ligand has the structure:



Claim 33 (original) The compound of claim 30, wherein the ligand has the structure:

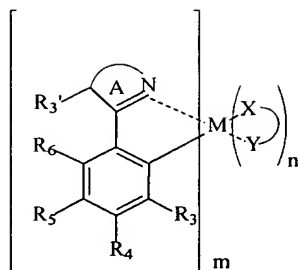


Claim 34 (original) The compound of claim 33, wherein the ligand has the structure:



Claim 35 (currently amended) An organic light emitting device, comprising:

- (a) an anode;
- (b) a cathode; and
- (c) an emissive layer disposed between the anode and the cathode, wherein the emissive layer comprises ~~further comprising~~ an emissive material having the structure:



wherein

M is a metal having an atomic weight greater than 40;

R_3' is a substituent selected from the group consisting of alkyl, heteroalkyl, aryl, heteroaryl, and aralkyl, wherein R_3' is optionally substituted by one or more substituents Z;

R_5 is a substituent selected from the group consisting of aryl and heteroaryl, wherein said aryl or heteroaryl is unsubstituted or optionally, substituted with one or more non-aromatic groups;

ring A is an aromatic heterocyclic or a fused aromatic heterocyclic ring with at least one nitrogen atom that is coordinated to the metal M, wherein the ring A can be optionally substituted with one or more non-aromatic groups;

R_3 , R_4 , and R_6 is are each independently a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, perfluoroalkyl CF_3 , C_nF_{2n+1} , trifluorovinyl, CO_2R , $C(O)R$, NR_2 , NO_2 , OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;

~~R_4 is a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, CF_3 , C_nF_{2n+1} , trifluorovinyl, CO_2R , $C(O)R$, NR_2 , NO_2 , OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;~~

additionally or ~~alternatively~~ alternatively, R_3 and R_4 , together form independently a fused 4 to 7-member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl; and wherein said cyclic group is optionally substituted by one or more ~~substituents~~ substituent Z;

~~R_6 is a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, CF_3 , C_nF_{2n+1} , trifluorovinyl, CO_2R , $C(O)R$, NR_2 , NO_2 , OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;~~

~~alternatively, R₃' and R₆ may be bridged by a group selected from CR₂-CR₂, CR=CR, CR₂, O, NR, O-CR₂, NR-CR₂, and N=CR;~~

each R is independently H, alkyl, alkenyl, alkynyl, heteroalkyl, aryl, heteroaryl, or aralkyl; wherein R is optionally substituted by one or more substituents Z;

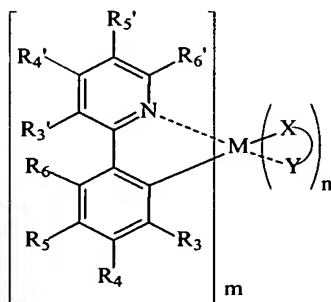
each Z is independently a halogen, R', O-R', N(R')₂, SR', C(O)R', C(O)OR', C(O)N(R')₂, CN, NO₂, SO₂, SOR', SO₂R', or SO₃R';

~~each~~ Each R' is independently H, alkyl, perhaloalkyl, alkenyl, alkynyl, heteroalkyl, aralkyl, aryl, or heteroaryl;

(X-Y) is an ancillary ligand;

m is a value from 1 to the maximum number of ligands that may be attached to the metal; and m + n is the maximum number of ligands that may be attached to the metal.

Claim 36 (currently amended) The device of claim 35, wherein the compound has the structure:



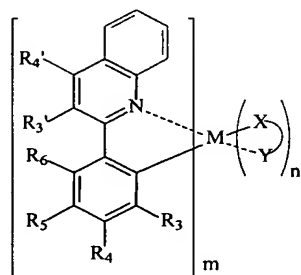
wherein

R₄', R₅', and R₆' are each independently H, alkyl, alkenyl, alkynyl, heteroalkyl, ~~alkenyl, alkynyl, heteroalkyl~~, aryl, heteroaryl, aralkyl; and wherein R₄', R₅', and R₆' are optionally substituted by one or more substituents Z; and

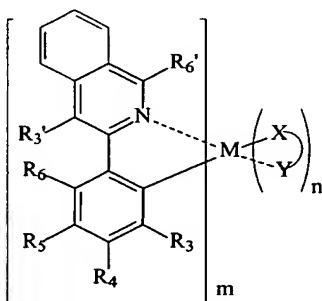
additionally or alternatively, any one or more of R₄' and R₅', or R₅' and R₆', or R₃ and R₄, together form independently a fused 4- to 7-member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl; and wherein said cyclic group is optionally substituted by one or more substituent Z;

~~— additionally or alternatively, R₃' and R₆ are linked by a group having the formula:—
~~CR₂-CR₂, CR=CR, CR₂, O, NR, O-CR₂, NR-CR₂, N=CR~~ wherein R is
 selected from the group consisting of H, alkyl, aryl, and aralkyl.~~

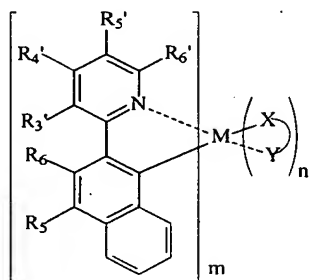
Claim 37 (original) The device of claim 36, wherein the compound has the structure:



Claim 38 (original) The device of claim 36, wherein the compound has the structure:



Claim 39 (currently amended) The device ~~material~~ of claim 36, wherein the compound has the structure:

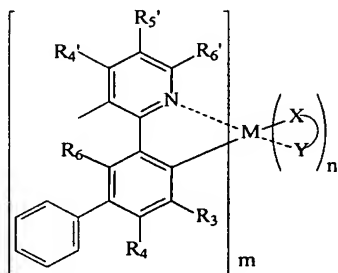


Claim 40 The device of claim 36, wherein R₅ is substituted or unsubstituted phenyl, naphthyl or pyridyl.

Claim 41 (original) The device of claim 40, wherein R_5 is a phenyl.

Claim 42 (original) The device of claim 40, wherein R'_3 is a methyl group.

Claim 43 (original) The device of claim 36, wherein the compound has the structure:

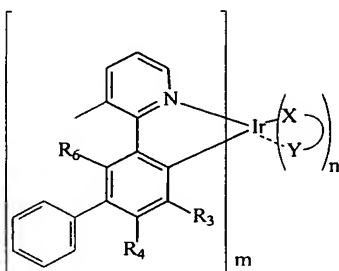


wherein R_5' and R_6' are H, and additionally or alternatively, together form a fused 4- to 7- member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl.

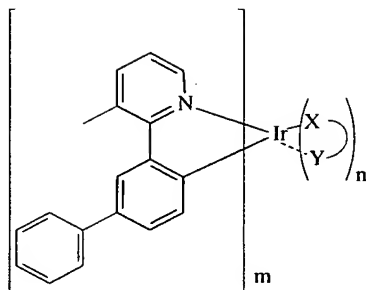
Claim 44 (original) The device of claim 43, wherein M is selected from the group consisting of Ir, Pt, Pd, Rh, Re, Ru, Os, Tl, Pb, Bi, In, Sn, Sb, Te, Au, and Ag.

Claim 45 (original) The device of claim 44, wherein M is Ir.

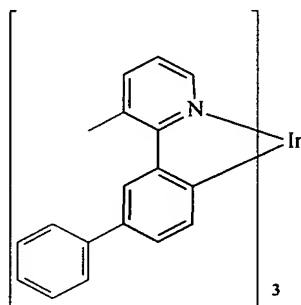
Claim 46 (original) The device of claim 45, wherein the compound has the structure:



Claim 47 (original) The device of claim 46, wherein the compound has the structure:

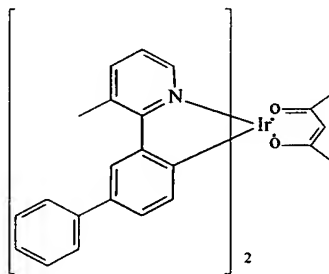


Claim 48 (original) The device of claim 47, wherein m is 3 and n is zero, such that the compound has the structure:

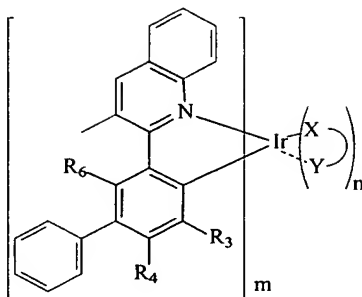


Claim 49 (original) The device of claim 47, wherein m is 2 and n is 1.

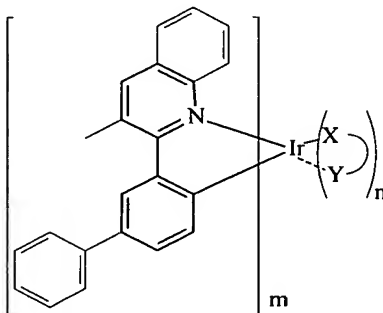
Claim 50 (currently amended) The device of claim 49, ~~having~~ wherein the compound has the structure:



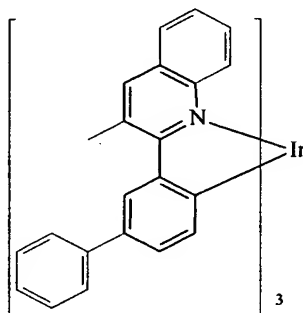
Claim 51 (currently amended) The device of claim 45, ~~having~~ wherein the compound has the structure:



Claim 52 (original) The device of claim 51, wherein the compound has the structure:

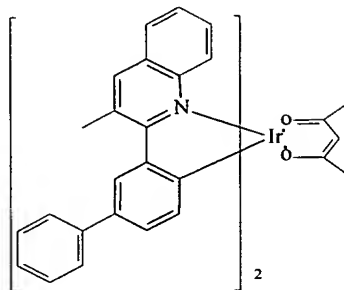


Claim 53 (original) The device of claim 52, wherein m is 3 and n is zero, such that the compound has the structure:



Claim 54 (original) The device of claim 52, wherein m is 2 and n is 1.

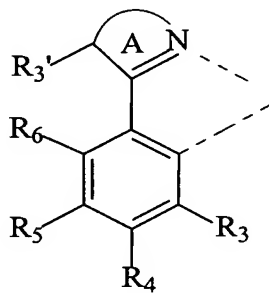
Claim 55 (currently amended) The device of claim 54, ~~having~~ wherein the compound has the structure:



Claim 56 (original) The device of claim 35, wherein the device is incorporated into a consumer product.

Claim 57 (currently amended) An organic light emitting device, comprising:

- (d) (a) an anode;
- (e) (b) a cathode; and
- (f) (c) an emissive layer disposed between the anode and the cathode,
 wherein the emissive layer comprises ~~further comprising~~ an emissive material having a ligand with the structure:



wherein

~~M is a metal having an atomic weight greater than 40;~~

R₃' is a substituent selected from the group consisting of alkyl, heteroalkyl, aryl, heteroaryl, and aralkyl, wherein R₃' is optionally substituted by one or more substituents Z;

R₅ is a substituent selected from the group consisting of aryl and heteroaryl, wherein said aryl or heteroaryl is unsubstituted or optionally, substituted with one or more non-aromatic groups;

ring A is an aromatic heterocyclic or a fused aromatic heterocyclic ring with at least one nitrogen atom that is coordinated to the metal M, wherein the ring A can be optionally substituted with one or more substituents Z;

R_3 , R_4 , and R_6 ~~is~~ are each independently a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, perfluoroalkyl CF_3 , C_nF_{2n+1} , trifluorovinyl, CO_2R , $C(O)R$, NR_2 , NO_2 , OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;

R_4 ~~is a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, CF_3 , C_nF_{2n+1} , trifluorovinyl, CO_2R , $C(O)R$, NR_2 , NO_2 , OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;~~

additionally or ~~alternatively~~ alternatively, R_3 and R_4 , together form independently a fused 4 to 7-member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl; and wherein said cyclic group is optionally substituted by one or more ~~substituents~~ substituent Z;

R_6 ~~is a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, CF_3 , C_nF_{2n+1} , trifluorovinyl, CO_2R , $C(O)R$, NR_2 , NO_2 , OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;~~

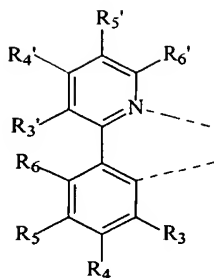
~~alternatively, R_3 and R_6 may be bridged by a group selected from CR_2-CR_2 , $CR=CR$, CR_2-O , NR , $O-CR_2$, $NR-CR_2$, and $N=CR$;~~

each R is independently H, alkyl, alkenyl, alkynyl, heteroalkyl, aryl, heteroaryl, or aralkyl; wherein R is optionally substituted by one or more substituents Z;

each Z is independently a halogen, R' , $O-R'$, $N(R')_2$, SR' , $C(O)R'$, $C(O)OR'$, $C(O)N(R')_2$, CN, NO_2 , SO_2 , SOR' , SO_2R' , or SO_3R' ;

each R' is independently H, alkyl, perhaloalkyl, alkenyl, alkynyl, heteroalkyl, aralkyl, aryl, or heteroaryl.

Claim 58 (currently amended) The device of claim 57, wherein the ligand has the structure



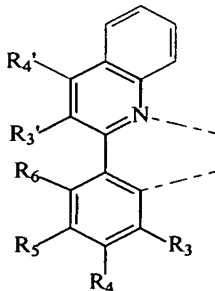
wherein

R_4' , R_5' , and R_6' are each independently H, alkyl, alkenyl, alkynyl, heteroalkyl, ~~alkenyl, alkynyl, heteroalkyl,~~ aryl, heteroaryl, aralkyl; and wherein R_4' , R_5' , and R_6' are optionally substituted by one or more substituents Z; and

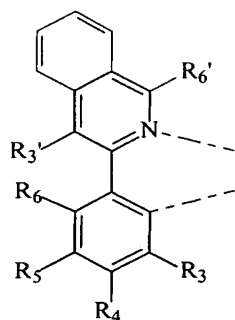
additionally or alternatively, any one or more of R_4' and R_5' , or R_5' and R_6' , or R_3 and R_4 , together form independently a fused 4- to 7-member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl; and wherein said cyclic group is optionally substituted by one or more substituent Z;

~~additionally or alternatively, R_3' and R_6 are linked by a group having the formula: CR_2-CR_2 , $CR=CR$, CR_2 , O, NR, O CR_2 , NR CR_2 , $N=CR$ wherein R is selected from the group consisting of H, alkyl, aryl, and aralkyl.~~

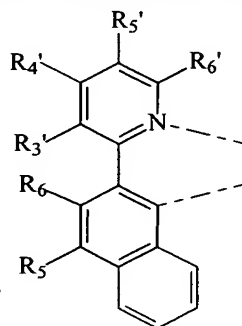
Claim 59 (original) The device of claim 58, wherein the ligand has the structure:



Claim 60 (original) The device of claim 58, wherein the ligand has the structure:



Claim 61 (original) The device of claim 58, wherein the ligand has the structure:

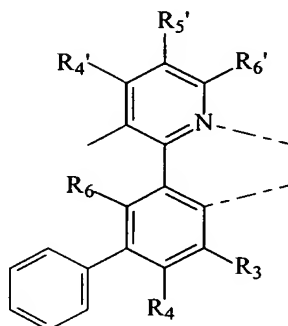


Claim 62 (original) The device of claim 58, wherein R_5 is substituted or unsubstituted phenyl, naphthyl or pyridyl.

Claim 63 (original) The device of claim 62, wherein R_5 is a phenyl.

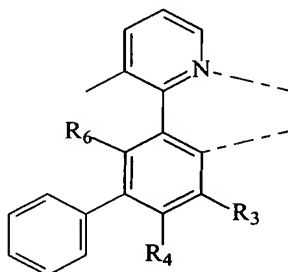
Claim 64 (original) The device of claim 62, wherein R'_3 is a methyl group.

Claim 65 (original) The device of claim 58, wherein the ligand has the structure:

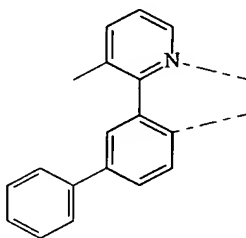


wherein R_5' and R_6' are H, and additionally or alternatively, together form a fused 4- to 7- member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl.

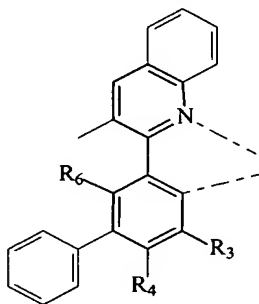
Claim 66 (original) The device of claim 65, wherein the ligand has the structure:



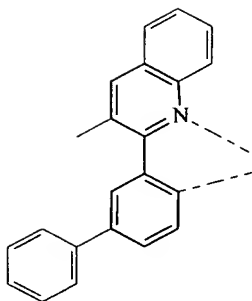
Claim 67 (original) The device of claim 66, wherein the ligand has the structure:



Claim 68 (original) The device of claim 65, wherein the ligand has the structure:



Claim 69 (original) The device of claim 68, wherein the ligand has the structure:



Claim 70 (original) The device of claim 57, wherein the device is incorporated into a consumer product.